Box Plots

- Establish an axis with a scale.
- Draw a box that extends from the lower to the upper quartile.
- Draw a line from the lower quartile to the minimum and another line from the upper quartile to the maximum.

Outlier Box Plots

- Establishes boundaries on what are “usual” values based on the width of the box.
- Values outside the boundaries are flagged as potential outliers.

Contents of Regular Cola

<table>
<thead>
<tr>
<th>Weight (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>360</td>
</tr>
<tr>
<td>365</td>
</tr>
<tr>
<td>370</td>
</tr>
<tr>
<td>375</td>
</tr>
<tr>
<td>380</td>
</tr>
</tbody>
</table>

Graph showing the distribution of contents weights with outliers indicated.
Comparing Groups

- **Regular**
  - Min: 362 g
  - QL: 366.5 g
  - Med: 368.5 g
  - QU: 370 g
  - Max: 378 g

- **Diet**
  - Min: 349 g
  - QL: 352.5 g
  - Med: 354 g
  - QU: 355 g
  - Max: 357 g

Comparing Groups

- Compare shape.
- Compare center.
- Compare spread.
- Compare outliers, if there are any.
Comparing Groups

Symmetric Distributions

- Measure of Center
  - Sample mean
  \[ \overline{y} = \frac{\text{Total}}{n} = \frac{\left( \sum y_i \right)}{n} \]

Octane Rating

87.4, 88.4, 88.7, 88.9, 89.3, 89.6, 89.7
89.8, 89.8, 89.9, 90.0, 90.1, 90.3, 90.4, 90.4
90.4, 90.5, 90.6, 90.7, 91.0, 91.1, 91.1, 91.2
91.2, 91.6, 91.6, 91.8, 91.8, 92.2, 92.2, 92.2
92.3, 92.6, 92.7, 92.7, 93.0, 93.3, 93.7, 94.4
Octane Rating

Octane Rating Mean

- Total = 3637.9
- n = 40

\[ \bar{y} = \frac{Total}{n} = \frac{3637.9}{40} = 90.95 \]

Mean or Median?

- The sample mean is the balance point of the distribution.
- The sample median divides the distribution into a lower and an upper half.
- For skewed data, report the sample median.